

Draft Staff Report

**Basin Plan Amendment to Incorporate a Variance
Provision for the Groundwater Mineral Quality
Objectives**

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Los Angeles Regional Water Quality Control Board

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I. INTRODUCTION

Regional Board staff recommends adoption of a Basin Plan amendment to allow a variance from the mineral quality objectives for groundwater basins when specified criteria are met. If adopted, the Regional Board would have the authority to grant a variance to a discharger(s) from mineral quality objectives (contained in Table 3-10 of the 1994 Basin Plan). This authority would be limited in geographic scope to coastal aquifers in situations where elevated concentrations of minerals are caused by natural sources due to an aquifer's proximity to the coast, including seawater intrusion, presence of marine sediments or tidal fluctuations.

The impetus for this amendment resulted from several requests from the regulated community and other interested parties to de-designate the Municipal and Domestic Supply (MUN) beneficial use from portions of groundwater basins. The primary justification given for these requests was the presence of naturally elevated levels of total dissolved solids (TDS)¹ in the groundwater. The State Water Resources Control Board (State Board) identified the presence of elevated TDS as one of several exceptions to the provisions of the Statewide Sources of Drinking Water Policy previously adopted by the State Board (Resolution No. 88-63). This policy broadly defines "sources of drinking water" as those water bodies with beneficial uses designated as suitable, or potentially suitable, for municipal and domestic supply (MUN).² Through the policy, the State Board required that the Regional Boards designate all surface and ground waters as suitable, or potentially suitable, for municipal and domestic supply with certain exceptions (listed in Section II.B. of this report).

The Regional Boards were given the prerogative to apply the exceptions contained in the policy to water bodies in the region or to designate all water bodies as potentially suitable as municipal and domestic supply if they were not already so designated.

In the case of groundwater in the Los Angeles Region, most groundwater basins were already designated as existing or potential MUN in the Basin Plan, predating State Board's adoption of the Sources of Drinking Water Policy. At the time of the Regional Board's incorporation of the statewide policy into the Los

¹ Total dissolved solids (TDS) are comprised of inorganic salts (principally calcium, magnesium, potassium, sodium, bicarbonates, chlorides and sulfates) and some small amounts of organic matter that are dissolved in water.

² Municipal and Domestic Supply (MUN) is defined in the Water Quality Control Plan for the Los Angeles Region as "Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply." (p. 2-1, Water Quality Control Plan, Los Angeles Region, June 13, 1994).

Angeles Region Basin Plan in 1989, the Regional Board did not invoke any of the exceptions to designation for groundwater basins in the region.

Though portions of some groundwater basins have poor mineral quality (i.e. high concentrations of TDS that exceed the policy's threshold of 3,000 mg/L), Regional Board staff recommends against dedesignating the MUN use for these groundwater areas. It is the position of Regional Board staff that it is not unreasonable, given the increasing regional demand for water, periodic water shortages, controversy over imported water supplies, and current desalinization technology, to anticipate that the groundwaters proposed for dedesignation may be used directly or indirectly as water supplies at some future time. Protecting potable water supplies (current and future) is particularly important in southern California given the shortage of water and the growing population.

II. BACKGROUND

(A) Mineral Quality Objectives for Groundwater

The Porter Cologne Water Quality Control Act (Cal. Water Code, Division 7) requires the Regional Boards to formulate and adopt water quality control plans (Basin Plans) to protect the quality of all the waters of the state. "Waters of the state" means any surface water or groundwater, including saline waters, within the boundaries of the state (CWC, section 13050(e)).

The Porter Cologne Water Quality Control Act also requires the Regional Boards to establish water quality objectives in Basin Plans that are sufficient to protect the beneficial uses designated for each water body found within its region (CWC, section 13241). These objectives must be consistent with the state's anti-degradation policy (State Board Resolution 68-16).

The current Basin Plan for the Los Angeles Region contains mineral water quality objectives for TDS, sulfate, chloride and boron in ground waters.

For ground waters having the MUN beneficial use, maximum contaminant levels (MCLs) derived from Title 22 of the California Code of Regulations and bacterial objectives also apply and are incorporated by reference in the 1994 Basin Plan in Tables 3-5, 3-6, 3-7, and 3-9.

The Basin Plan also includes groundwater quality objectives for nitrogen compounds and taste and odor objectives to protect designated beneficial uses of groundwater and prevent degradation of groundwater resources.

(B) Beneficial Uses of Groundwater and Relationship to Mineral Quality

In 1986, California voters passed Proposition 65, the Safe Drinking Water and Toxic Enforcement Act, which required public notification when specified toxic chemicals were discharged into "sources of drinking water." The State Water Resources Control Board (State Board) analyzed the definitions for "Sources of Drinking Water" found in the nine Regional Water Quality Control Plans (Basin Plans). It was determined that the plans did "not provide sufficient detail in the description of water bodies designated MUN to judge clearly what is, or is not, a source of drinking water for various purposes."

Therefore, in 1988, the State Board adopted Resolution No. 88-63, the Sources of Drinking Water Policy.³ The policy had two outcomes. First, the policy broadly defined "sources of drinking water" as those water bodies with beneficial uses designated as suitable, or potentially suitable, for municipal and domestic supply (MUN). Second, the policy required that Regional Boards designate all surface and ground waters as suitable, or potentially suitable, for municipal and domestic supply, allowing only certain exceptions.

The exceptions allowed by the policy for groundwater include the following:

1. Surface and ground waters where:

- a. The total dissolved solids (TDS) exceed 3,000 mg/L (5,000 μ S/cm, electrical conductivity) and it is not reasonably expected by Regional Boards to supply a public water system, or
- b. There is contamination, either by natural processes or by human activity (unrelated to the specific pollution incident), that cannot reasonably be treated for domestic use using either best management practices or best economically achievable treatment practices, or
- c. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

2. Ground water where:

The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 Code of Federal Regulations (CFR), Section 146.4. This special status is done for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, Section 261.3.

In 1989, the Regional Board adopted Resolution 89-03, amending the Water Quality Control Plan for the Los Angeles Region per the directive in State Board

³ See State Board Resolution No. 88-63 (Appendix A).

Resolution 88-63. As a result, all of the groundwater basins in the Los Angeles region were assigned the MUN beneficial use in 1989.

(C) Requests for De-designation of the MUN use on the Basis of High TDS Concentrations

Currently all ground waters with the exception of the two areas described below are designated as either 'existing' or 'potential' MUN in the Los Angeles Region Basin Plan. Most of these MUN use designations of the ground water basins pre-date the incorporation of the Sources of Drinking Water Policy into the Basin Plan for the Los Angeles Region in 1989.

In 1998, the Regional Board adopted amendments to the Basin Plan that de-designated the MUN beneficial use from portions of two groundwater basins:

Groundwater area underlying the Chevron El Segundo Refinery – The de-designation was intended at a policy level to facilitate the use of reclaimed water rather than potable water for injection projects associated with site cleanups in an area that was seaward of the West Coast Basin Barrier Project. The justification for the de-designation was based on the fact that production of groundwater seaward of an injection barrier (injection barriers are designed to prevent further seawater intrusion) is discouraged because it would interfere with hydraulic gradients needed to maintain the barrier. It was also assumed that groundwater seaward of the injection barrier could not be used as a drinking water source.

Groundwater area underlying Terminal Island and adjacent areas of LA and Long Beach Harbors – The justification for this de-designation was that during the past 100 years, these areas filled with marine dredge sediments. This resulted in the degradation of groundwater quality such that the area is now not suitable as a drinking water source.

From 2000 to 2004, Regional Board staff have received four additional requests to consider removing the MUN beneficial use from other groundwater areas on the basis of exceptions identified in the Sources of Drinking Water Policy. In the process of evaluating these requests for de-designation, it became apparent to staff and management that a consistent, regional framework for addressing these groundwater issues was needed to address these and future requests.

III. ALTERNATIVES ANALYSIS

(A) Identification of Alternatives

1. Removal of the MUN Designation

This alternative entails removal of the MUN beneficial use designation for coastal aquifers where elevated concentrations of minerals are caused by natural sources due to an aquifer's proximity to the coast, including seawater intrusion, presence of marine sediments or tidal fluctuations. By removing the use, the associated objectives set to protect the MUN use, namely the Maximum Contaminant Levels found in Title 22 and incorporated into the Basin Plan, would no longer be applicable.

Pros:

This alternative would ensure that the Region's beneficial uses accurately reflect the historical, current and future use of these water bodies as existing or potentially suitable sources of drinking water. For example, a groundwater basin may have the MUN use designation, but due to seawater intrusion mineral concentrations are highly elevated making its use as a source of drinking water unlikely.

De-designation of these areas could be consistent with the State Board Sources of Drinking Water Policy as well as previous Regional Board actions. Some of the groundwater areas at issue have poor mineral quality (i.e. high concentrations of total dissolved solids), exceeding the threshold of 3,000 mg/L TDS identified in the policy at certain locations and times.

De-designation of these areas will not result in a regulatory vacuum. The Regional Board will still have available a number of regulatory tools to help ensure that these groundwater areas are protected. These include requirements to protect other beneficial uses of these ground water basins, achieve water quality objectives that generally apply to ground water, and to enforce the State's Anti-degradation Policy (State Board Resolution 68-16).

Cons:

The mission of the Regional Boards is to ensure that suitable water quality is maintained or restored and available whenever it may be needed for the MUN beneficial use. Though these areas may not be currently used as water supplies, the Regional Board is obligated to protect potential beneficial uses of waters of the state. Potential uses are assigned to a water body if:

- 1) there are plans to put the water to such future use, or
- 2) there is a potential to put the water to such future use, or

- 3) the Regional Board has designated the use as a water quality goal, or
- 4) there is a public desire to put the water to such future use.
(See 1994 Basin Plan, p. 2-1)

It is not unreasonable, given the regional demand for water supplies, periodic water shortages, controversy over imported water supplies, and current desalinization technology, to anticipate that the ground waters proposed for de-designation may be used as water supplies in the future. Even waters with TDS concentrations in excess of the current policy threshold of 3,000 mg/L can be used as a water supply using desalinization technology.⁴ This has been demonstrated in the Los Angeles Region at desalinization facilities such as the Southern California Edison/Catalina Island Desalination Plant and Long Beach Pilot Desalination Facility.

Furthermore, when setting groundwater clean-up requirements, the Regional Board has heavily relied upon MCLs, used to protect the MUN use, in conjunction with the state's anti-degradation policy. There is concern that groundwater remediation may be compromised if the MUN use is removed, since absent the MUN designation MCLs will no longer be applicable.

2. Variance from mineral quality objectives

A variance from the mineral objectives could be granted where elevated concentrations of minerals are due to natural sources. The variance would provide relief from mineral quality objectives (contained in Table 3-10 of the 1994 Basin Plan) due to an aquifer's proximity to seawater, including seawater intrusion, presence of marine sediments or tidal fluctuations.

Pros:

This is the most moderate of the three options. The no action option is unresponsive to the growing numbers of agencies seeking some solution to the high concentrations of minerals that are uncontrollable, since they are due to natural causes. The de-designation option may inappropriately remove the MUN beneficial use of these waters and provide relief from achieving other objectives that can be controlled. This alternative that allows for a variance from these objectives under limited circumstances provides a reasonable compromise.

Cons:

In the evaluation of requests, there could be some difficulty in determining with certainty that the source of elevated minerals is natural and not human induced.

⁴ For reference, the concentration of seawater is ~ 35,000 mg/L.

This alternative could result in Regional Board staff getting inundated with requests for variances from individual dischargers. While the responsibility to provide the necessary data and information to justify the request would be on the discharger(s), there would be considerable work associated with the evaluation of the material provided and bringing the variance before the Regional Board.

3. No Action

Keep the existing MUN beneficial use designations and do not allow a variance from the mineral quality objectives.

Pros:

These designations provide the most aggressive protection for regional ground waters since the majority of ground water basins are currently designated as suitable or potentially suitable for use as municipal and domestic drinking water supplies. In southern California where potable water is often in short supply and where agencies are beginning to pilot de-salinization facilities to increase water supply, it may be prudent to retain the MUN beneficial use designation.

Cons:

The current designations may not accurately reflect the historical, current and/or future use of these water bodies as sources of drinking water.

Requiring that mineral objectives be met may not be reasonable where natural sources/causes are resulting in mineral concentrations above the water quality objectives.

(B) Recommended Alternative

Staff recommends alternative "2. Variance from mineral water quality objectives." The remainder of this staff report pertains to this alternative.

Table 1. Comparison of Pros and Cons of Alternatives

Alternative I: De-designation of MUN use	Alternative II: Variance from mineral water quality objectives	Alternative III: No Action
<p>Pros:</p> <ul style="list-style-type: none"> Some of the groundwater areas at issue have poor mineral quality (i.e. high concentrations of total dissolved solids) and may therefore exceed the Sources of Drinking Water Policy threshold of 3,000 mg/L of TDS. Makes a one-time decision and so does not require future evaluation. <p>Cons:</p> <ul style="list-style-type: none"> It is not unreasonable, given the regional demand for water supplies, periodic water shortages, controversy over imported water supplies, and current desalinization technology, to anticipate that the ground waters proposed for de-designation may be used as water supplies in the future. The mission of the Regional Boards is to ensure that suitable water quality is maintained or restored and available whenever it may be needed for the MUN beneficial use. Groundwater remediation may be compromised if the MUN use is removed, since absent the MUN designation MCLs will not apply. 	<p>Pros:</p> <ul style="list-style-type: none"> Acknowledges that natural conditions may lead to elevated concentrations of minerals in groundwater and that it is unreasonable to require a discharger(s) to achieve mineral quality objectives under these conditions. A variance is a more targeted regulatory tool to address the problem of compliance with mineral quality objectives. As such, it can be limited in its geographic scope, the conditions under which it may be applied, and its duration. A variance preserves the underlying water quality standards and the protection provided by those standards, while providing temporary relief where justified. <p>Cons:</p> <ul style="list-style-type: none"> A variance may not solve the underlying problem of natural conditions causing exceedances of the mineral quality objectives for groundwater. Ultimately, a Basin Plan amendment to revise the mineral quality objectives in these groundwater areas may be needed. Could pose some difficulty in determining with certainty that the only source of elevated concentrations is due to seawater influence and not a human induced problem. 	<p>Pros:</p> <ul style="list-style-type: none"> The MUN use designations provide the most aggressive protection for regional ground waters since the majority of ground water basins are currently designated as suitable or potentially suitable for use as municipal and domestic drinking water supplies. In southern California where potable water is often in short supply and where agencies are beginning to pilot de-salinization facilities to increase water supply, it may be prudent to retain the MUN beneficial use designation. <p>Cons:</p> <ul style="list-style-type: none"> The current designations may not accurately reflect the historical, current and potential future use of these water bodies as sources of drinking water. Strictly applying the mineral quality objectives to groundwater without provisions authorizing the Regional Board to issue variances may be unreasonable where elevated mineral concentrations are due to natural conditions.

IV. CONDITIONS FOR GRANTING A VARIANCE

This amendment would allow a variance from mineral water quality objectives under specified conditions. The conditions are described below.

- A demonstration that the source of the elevated mineral concentrations is clearly natural and not induced by human activities such as:
 - waste treatment discharge;
 - confined animal facilities and rangeland animal management;
 - nurseries lacking discharge control;
 - application of dust suppressants such as Magnesium Chloride on dirt roads;
 - urban runoff; and
 - irrigation return flow from agriculture.

- A demonstration that the cause of elevated mineral concentrations is natural in origin and specifically related to an aquifer's proximity to the coast including:
 - seawater intrusion;
 - presence of marine sediments; or
 - tidal fluctuations.

- All other applicable water quality objectives would continue to apply. These objectives are set to protect the MUN use and other groundwater beneficial uses, as well as to prevent degradation of groundwater quality per state anti-degradation requirements (State Board Resolution 68-16).

- It is not the intent of the Regional Board staff, by way of these amendments, to alter the clean-up goals for groundwater remediation in these areas. Staff sets groundwater clean up goals based on the State's antidegradation policy (State Board Resolution 68-16), which requires that naturally occurring pollutants be reduced to background levels and man-made pollutants to non-detectable levels. Per State Board Resolution 68-16, clean-up levels for the restoration of water quality must, at a minimum:
 - Be consistent with maximum benefits to the people of the state,
 - Consider all beneficial uses of the waters, and
 - Not result in water quality less than that prescribed by the Basin Plan and policies adopted by the State and Regional Boards.

- When prescribing groundwater remediation requirements, Regional Board staff considers other Basin Plan requirements and Statewide policies. For example, the Statewide Containment Policy (State Board Resolution No. 92-49) establishes clean-up and abatement policies and procedures for

those cases of pollution where it is not reasonable to restore water quality to background levels.

- Water quality objectives are to be met by applying the objectives to controllable water quality factors. Controllable factors must be controlled so as to not lead to further degradation of water quality in instances where uncontrollable factors (natural conditions) have already resulted in water quality objectives being exceeded.

V. WATER CODE 13241 FACTORS

The California Water Code (CWC), section 13241, specifies that Regional Boards shall establish water quality objectives that in its judgement will ensure the reasonable protection of beneficial uses and the prevention of nuisances. Factors to be considered by a Regional Board when establishing water quality objectives shall include, but not necessarily be limited to all of the following:

1. Past, present and probable future beneficial uses of water.

This amendment does not alter the beneficial uses of any groundwaters in the region. Rather it allows a variance from groundwater mineral objectives where mineral concentrations are elevated in coastal areas due to natural sources/causes.

2. Environmental characteristics of the hydrographic units under consideration including the quality of the water available thereto.

The environmental characteristics of the groundwater areas under consideration will be evaluated where a request for a variance is made. Board staff will evaluate the characteristics as they pertain to determining whether a variance will be allowed using the criteria outlined in the Basin Plan amendment language.

3. Water quality conditions that could reasonably be achieved through coordinated control of all factors, which affect water quality in the area.

The "Beneficial Uses" and "Water Quality Objectives" chapters of the Basin Plan (Water Quality Control Plan for the Los Angeles Region) are incorporated by reference to address this factor as well as to provide additional information on factors (1) and (2) above.

4. Economic considerations.

Economic benefit may ensue for those entities conducting ground water cleanup projects where a variance from mineral objectives is granted. In addition, a variance may facilitate the use of (non-potable) reclaimed

water for ground water injection projects. However, as stated above, a variance from mineral quality objectives does not necessarily alleviate responsible parties of the requirement to clean up contamination resulting from past spills or leaks. This is important in order to protect the beneficial uses of groundwater, achieve other applicable water quality objectives and comply with State anti-degradation requirements (see section V.C.).

5. The need for developing housing within the region.

A variance from the groundwater mineral objectives should not affect the housing market.

6. The need to develop and use recycled water.

A variance from the groundwater mineral objectives may encourage the development or use of recycled water, where reclaimed water may now be allowed to recharge the aquifer.

VI. RECOMMENDED ALTERNATIVE AND PROPOSED BASIN PLAN AMENDMENT

Alternative 2

This Basin Plan amendment would authorize the Regional Board to issue variances to dischargers if justified to provide relief from the groundwater mineral quality objectives in the Basin Plan where mineral concentrations are naturally elevated in coastal aquifers. The natural conditions causing the elevated mineral concentrations could include but are not limited to an aquifer's proximity to seawater, including seawater intrusion, presence of marine sediments or tidal fluctuations.

The following language appears in the Basin Plan Amendment language:

Coastal Aquifer Variance Process for Mineral Quality Objectives

In coastal aquifers where elevated concentrations of minerals are caused by natural sources due to an aquifer's proximity to the ocean, the Regional Board may grant a variance from implementing the mineral objectives specified in Table 3-11 when issuing waste discharge requirements (WDRs) or enforcement orders to achieve mineral quality objectives. Any variance granted pursuant to this variance process shall be for no more than five years, and may be extended not more than once for an additional period of up to five years. Any further relief should be in the form of a Basin Plan amendment. A decision to issue or to extend a variance will be based upon the Regional Board's evaluation of the evidence submitted concerning the granting of the variance.

A discharger must submit to the Executive Officer a written request for a variance from compliance with the mineral quality objectives for groundwater. The request must include recent data and analysis that provide clear and convincing evidence that elevated mineral concentrations are natural in origin and result from the aquifer's proximity to the ocean. The discharger's request must include clear and convincing evidence and analysis that:

1. The aquifer's proximity to the ocean leads to one or more of the following:
 - a) seawater intrusion;
 - b) the presence of marine sediments high in mineral content;
 - c) tidal fluctuations that regularly influence the chemistry of the aquifer.
2. The source of the elevated mineral concentrations is natural and not induced by current or past human activities, including but not limited to specific pollution incidents and diffuse sources of anthropogenic pollutants.
3. That a discharge of minerals in excess of the mineral quality objectives in the coastal aquifer will not accelerate seawater intrusion or degrade adjacent, inland aquifers.

The Regional Board may only grant a variance after a duly noticed public meeting. The Regional Board's decision to grant or to deny a variance shall be based on the record, including the discharger's request and the comments of staff and interested persons. The Regional Board may only grant a variance upon the Regional Board's determination that the request satisfies the conditions specified above and that the variance is in the public interest. In granting a variance, the Regional Board must include appropriate requirements in the WDRs or enforcement order consistent with the State Water Resources Control Board's anti-degradation resolution (SWRCB Res. No. 68-16).

VII. CONCLUSIONS

Regional Board staff recommends that a Basin Plan amendment be adopted that would authorize the Regional Board to issue variances to dischargers from the mineral objectives for groundwater basins when certain criteria are met. Requests to seek relief from mineral quality objectives (contained in Table 3-10 of the 1994 Basin Plan) will be considered for coastal aquifers where elevated concentrations of minerals are caused by natural sources due to an aquifer's proximity to the coast, including but not limited to seawater intrusion, presence of marine sediments or tidal fluctuations. Requests must include a demonstration that the source of the elevated mineral concentration is clearly natural and not induced by human activities. Without exception, upon issuance of a variance from the mineral quality objectives by the Regional Board to a discharger, all other water quality objectives and requirements for groundwater continue in force.

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